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Digital Mapping, Charting, and Geodesy Analysis Program Technical Review of Modernized Catalog System Softcopy Catalog Prototype Edition 1.0

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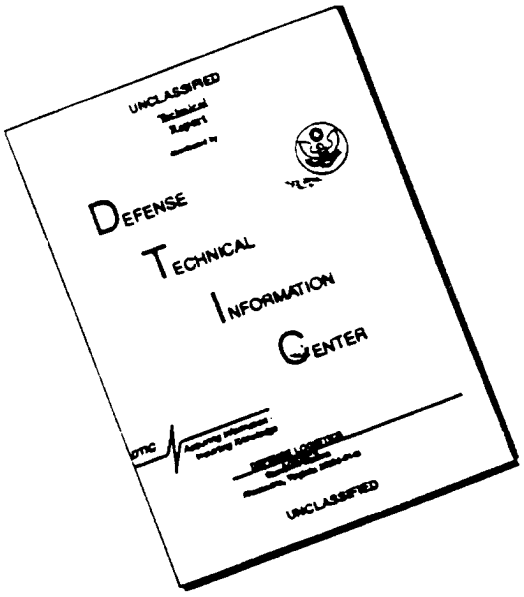

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The Modernized Catalog System (MCS) Softcopy Catalog (SCC) Prototype 1.0 is a digital map ordering product currently under development by the Defense Mapping Agency (DMA) that is designed to replace existing DMA hardcopy catalogs. The MCS SCC provides product information in both textual and graphical form from three database libraries: Standard Products, Non-Standard Products, and Requirements.

This is the second review performed by the Digital Mapping, Charting, and Geodesy Analysis Program (DMAP). Prototype 0.0 was completed in December 1994. Comments that were received on Prototype 0.0 after the report deadline are included. These comments were also forwarded to DMA and are only included in this evaluation in order to capture them in the overall Navy/Marine Corps evaluation process. An overall comparison of the two prototypes is made.

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Digital Mapping, Charting, and Geodesy Analysis Program Technical Review of Modernized Catalog System Softcopy Catalog Prototype Edition 1.0

1.0 Introduction

The Modernized Catalog System (MCS) Softcopy Catalog (SCC) Prototype 1.0 is a digital map ordering product currently under development by the Defense Mapping Agency (DMA) that is designed to replace existing DMA hardcopy catalogs. The MCS SCC provides product information in both textual and graphical form from three database libraries: Standard Products, Non-Standard Products, and Requirements.

This is the second review performed by the Digital Mapping, Charting, and Geodesy Analysis Program (DMAP). Prototype 0.0 was completed in December 1994. Comments that were received on Prototype 0.0 after the report deadline are included in Section 5.0. These comments were also forwarded to DMA and are only included in this evaluation to capture them in the overall Navy / Marine Corps evaluation process. An overall comparison of the two prototypes is made in Section 3.0. A quick visual comparison of the Vector Product Format (VPF) Tool provided in Prototype 0.0 and the Base Map VPF Tool provided in Prototype 1.0 is shown in Figure 1.

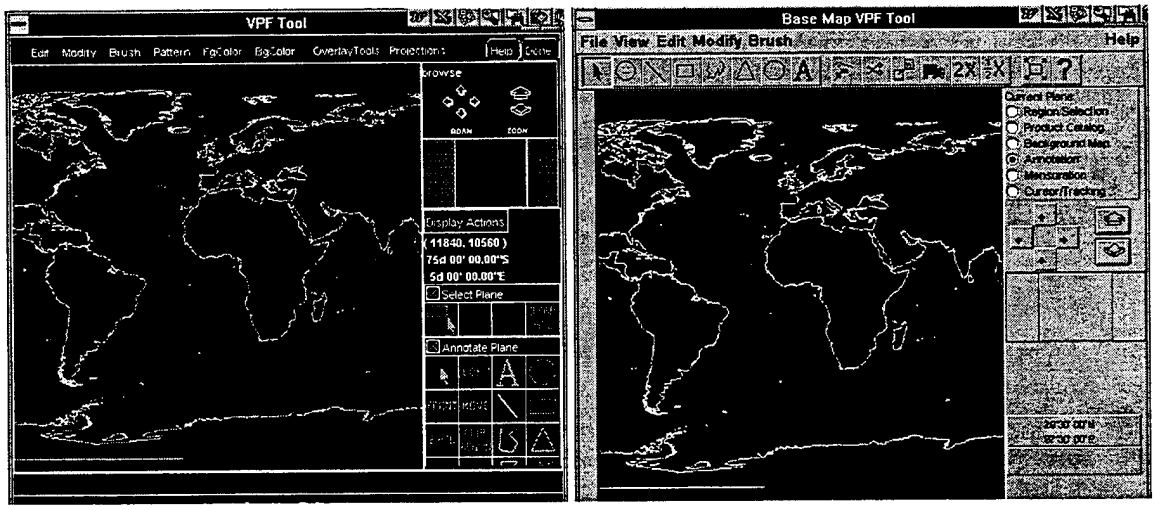


Figure 1. VPF Tool comparison

2.0 List of Essential and Suggested Comments

The following sections supply comments divided into "essential" or "suggested."

2.1 Essential

2.1.1 Overall Comments

DMA has identified the minimum configuration required to be a 386 25-MHz CPU system with 8 Mb RAM. This is probably very consistent with what is available in the field. However, based on the evaluation completed on a 486 with 8 Mb RAM (extremely slow), the 386 would have to be unbearable.

The intended users of this catalog will utilize personal computers as well as mission planning stations, such as the Tactical Aircraft Mission Planning Systems (TAMPS), the Tactial EA-6B Mission Support Systems (TEAMs), and Tomahawk. These mission planning systems are UNIX-based and will integrate MCS into these systems.

The Marine Corps plans to use the MCS in conjunction with Global Geospatial Information Systems and possibly the Digital Point Positioning Database. These will require UNIX compatibility.

The parts of the Modernized Catalog System that are proprietary need to be identified. The G-View software is proprietary. Will this require all users to purchase the G-View software? Will DMA supply the G-View software?

How to navigate between screens is not readily apparent. Also, the capability of going back a screen, or multiple screens, at a time should be provided.

Provide an escape mechanism to back out quickly and gracefully from erroneous selections (e.g., similar to a *stop button* on Internet programs, or *Control-C*, or *break*). Most of the requests are very time consuming, and several minutes are lost each time a wrong move is made.

One installation on a Gateway 2000 P5-60, Windows 3.11, 40 Mb RAM, still received a GROWSTUB Error (caused a General Protection Fault in Module Printer DLL); the *ignore* button did not work. The *cancel* button proceeded with the G-View program.

Often one gets unexpected heap errors (to display Mercator projection, for example) and U-E errors (on several queries).

When the user needs to provide input (e.g., geopolitical code), provide the user with pop-up choices to select from.

It was difficult to go to the Base Map, pick an area, do a query, and go back to the Base Map area to pick specific product items to order. Usually an error occurred that terminated the application (Gateway 2000 486DX, Windows 3.11).

The user interface is not a standard Windows interface. Super Video Graphics Adapter (SVGA) high resolution (1024 x 768) is normal for monitors that support that resolution and standard Windows programs work well in this high resolution. The G-View menu was nearly impossible to read in SVGA mode.

If the MCS is presented in the context of an end-user Windows application program, that program should behave as a standard Windows program. The MCS database should also be presented in an open format for use with other off-the-shelf software.

2.1.2 G-View

On the opening G-View screen, the drop menus for *File*, *Selected*, *Edit*, and *View* were not clear. If a selection is not meant to be available, it is normally a shaded gray area in MS Windows applications. However, these fonts were unreadable and the intent could be misleading to the user.

2.1.3 Base Map VPF Tool

When performing a Single Query with only one product line selected, the footprint drawn was not what was expected (appeared to be a graphics problem.) Multiple squares/lines were drawn, some never ending (Figures 2 and 3).

The zoom feature should zoom around the selected point (e.g., leave the selected point in the center of the zoom) .

2.1.3 Annotation

Under *brush*, the user was allowed to select the *dashed line* and *dotted line,* but neither changed the *solid line*.

When *zoom to full resolution* was selected, nothing was displayed.

When *scroll to location* was used, G-View popped up, but when *ok* or *cancel* was pressed, all of the G-View window did not disappear.

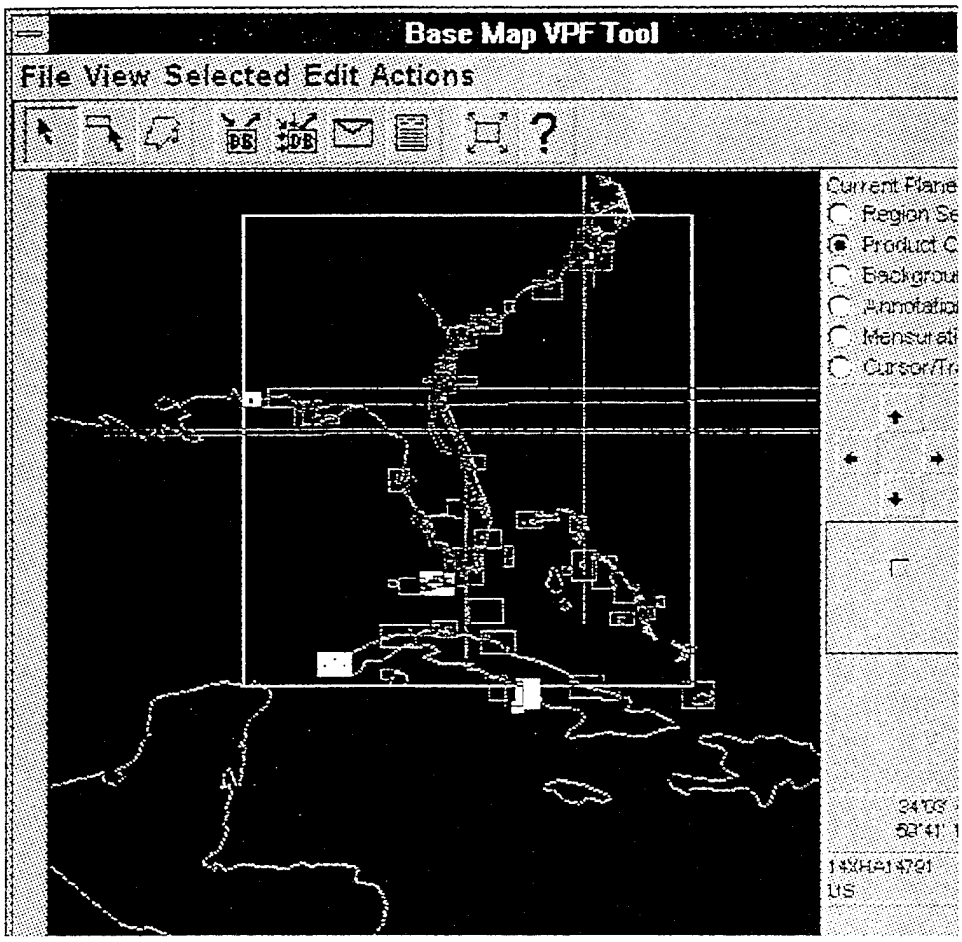


Figure 2. First example of selected products

The *region of interest (ROI)* and annotations were lost when the projection was changed. These selections the user has made should carry over between the projection systems. Changing between projection systems was very time consuming, averaging 9 minutes on a 486DX4/100. Also, nothing was displayed for the Universal Transverse Mercator (UTM) and Stereographic projections and they took just as long to calculate.

Under *Edit*, the *Create icon* did not show other features associated with the arrow.

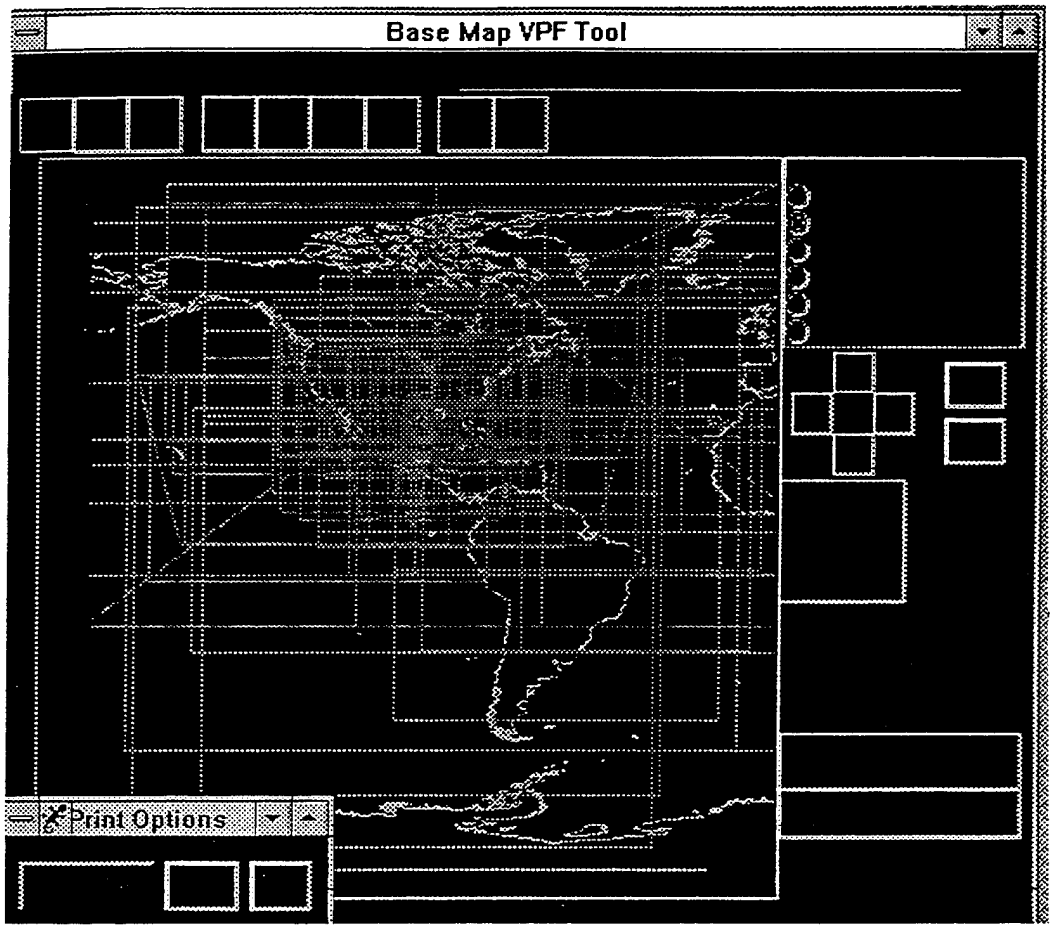


Figure 3. Second example of selected products

2.1.4 Product Catalog

When multiple products were selected with a box or polygon region, the region did not appear to stay fixed.

When the *example* icon was requested in the *metadata* menu, sometimes nothing happened (3AH, 2CA). (If an example does not exist for a product, a message should be displayed on the screen rather than no response.)

2.1.5 Product Examples

Several of the products did not have graphic examples (TLM-50, TTADB).

2.1.6 MS Windows 95

One Gateway 2000 P5-60 was upgraded with Microsoft Windows 95 and the prototype tested. This machine went from a 16-bit to a 32-bit operating system with the change. The increase in speed was very noticeable. Previously it took 80 seconds to open G-View (Windows 3.11, 32 Mb RAM), with the change to Windows 95, 32-bit, 32 Mb RAM, it only took 6 seconds.

MS Windows 95 uses the bottom of the screen for a Windows Toolbar. This toolbar overwrites the G-View windows and hides whatever is presented along the bottom of the screen. It was also noticed that the security classification menu remained at the bottom of the screen when the window was moved up.

2.2 Suggested

2.2.1 Overall Comments

Installation was good, a standard Windows setup. However, for anyone who had reviewed Prototype 0.0 and had not removed it from their computer, Prototype 1.0 did not overwrite the Windows icons in the Application Window. Documentation may suggest removing previous prototypes/editions if the program design will not automatically overwrite. Will the documentation address the extraneous icons (Changed Standards, Changed Non-Standards, Changed Requirements) that appear after the installation?

Sometimes when passing the cursor over the menu bar, menus appeared without pressing a button, other times they didn't (may be a mouse problem.)

When printing screens, the preferred print action would be to include only the top opened window, not to print all open windows, including the Program Manager (Figure 4).

2.2.2 Catalog Data Format

The MCS looked like an attempted VPF product, but it did not seem to play in other VPF software, specifically MUSE VPF_IMPORT. The various catalog tables appeared to be in an unknown format. The DMA catalog data is potentially very useful to a large number of systems, but only if the data is presented in a mainstream, open-system type format. We suggest a series of tables containing ASCII characters with fields delimited by commas or tabs, with the first line containing field names. Such a format is easily imported into a large number of off-the-shelf database and spreadsheet products.

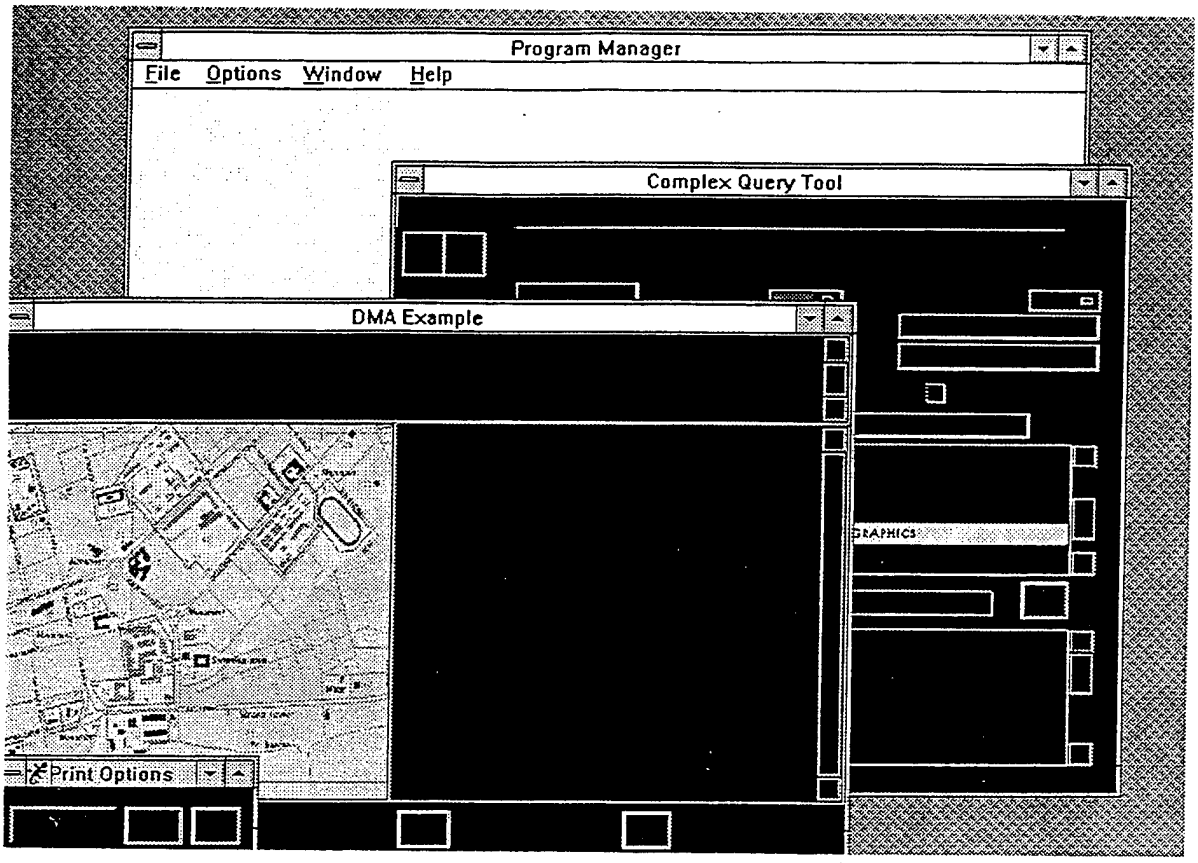


Figure 4. Example of multiple windows printed

2.2.2 G-View

In using *Help, On Version*, and *Select Products Screen,* the vertical scroll bar did not make repetitive moves on slide bar (e.g., holding mouse pointer on up/down scroll bar did not activate continuous movement, only one movement was made per click and hold). Typical Windows action provides constant movement. Note: This cursor movement works correctly under *Introductory Aids*.

2.2.3 Base Map VPF Tool

The Base Map is designed to center around the Atlantic Ocean. It would be better for the user to select the desired location and then use that location as the center point of the screen.

The Base Map VPF Tool overwrote the G-view window. We suggest moving the Base Map window to the center of the screen instead of lower left so the G-View windows is still visible to the user.

It would be nice to be able to take a snapshot of the Base Map, with product selections, etc.

When screen printing, the textual area was blackened and text could not be read. When using the cursor arrows to bring the image up on the screen (Windows 95 operating system), the tip of the Windows 95 toolbar was dragged onto the screen (Figure 5).

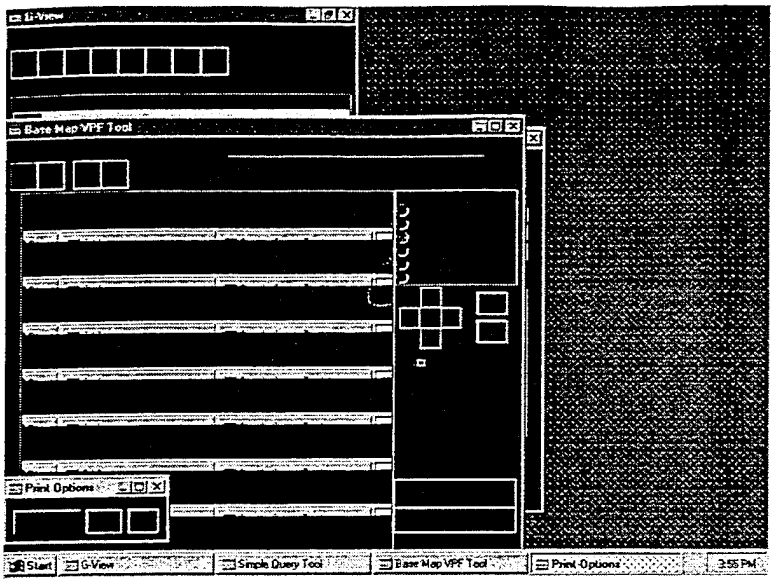


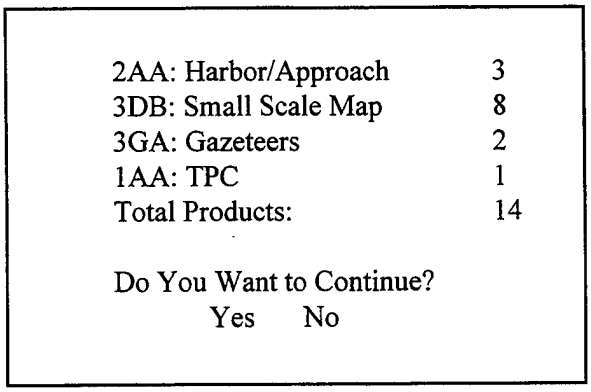
Figure 5. First example of blackened text area

At one point in the review (Windows 95), the arrow direction buttons disappeared; however, clicking in the area where the buttons were located worked. Also, we received an error that turned the screen to a white background with black text (actually, this was easier to read).

2.2.4 Simple Query Tool

It was very difficult to read products in the VGA mode of 640x800, 256 colors. Also, the security classification options were hidden from view unless the user picked up the window and moved it upward.

In selecting Aeronautic, TPC, lat min 30 15, lat max 30 30, long min -90 00 and long max -89 45 (New Orleans, Gulf Coast area), the summary window indicated:



When yes is selected, the screen went back to Simple Query Tool instead of providing an image of the base map or a listing of the products available. The same situation is true in selecting Topographic, 3CB: City Graphics.

2.2.5 Annotation

The *print window* option not only prints the window, but also the whole screen including the Program Manager background and every other open window (Figures 6 and 7). The option should be called *print screen* or, preferably, changed to "only print the selected top window." Also, the printout is not adjusted to the paper size (see examples in Figures 10 and 11). A feature could be offered to print landscape, letter, legal, executive, etc.

The toggle buttons are confusing to use. When clicking on the small button in the large button, the user would expect the other choices to be displayed, but the choices are not displayed. Only when the large button is pressed are the choices made available. An example of this can be seen if one selects *view*, *projections*, *orthographic*, and then in G-View, *north*.

When adding text to the base map, the *accept* button did nothing. The *cancel* button allowed text to be entered on base map; however, the text box didn't go away. With the *select icons* button, the entire alpha text box was expected to be deleted; however, only one character at a time was deleted.

2.2.6 Mensuration

Under *View, Projections, UTM*, the entire window went black.

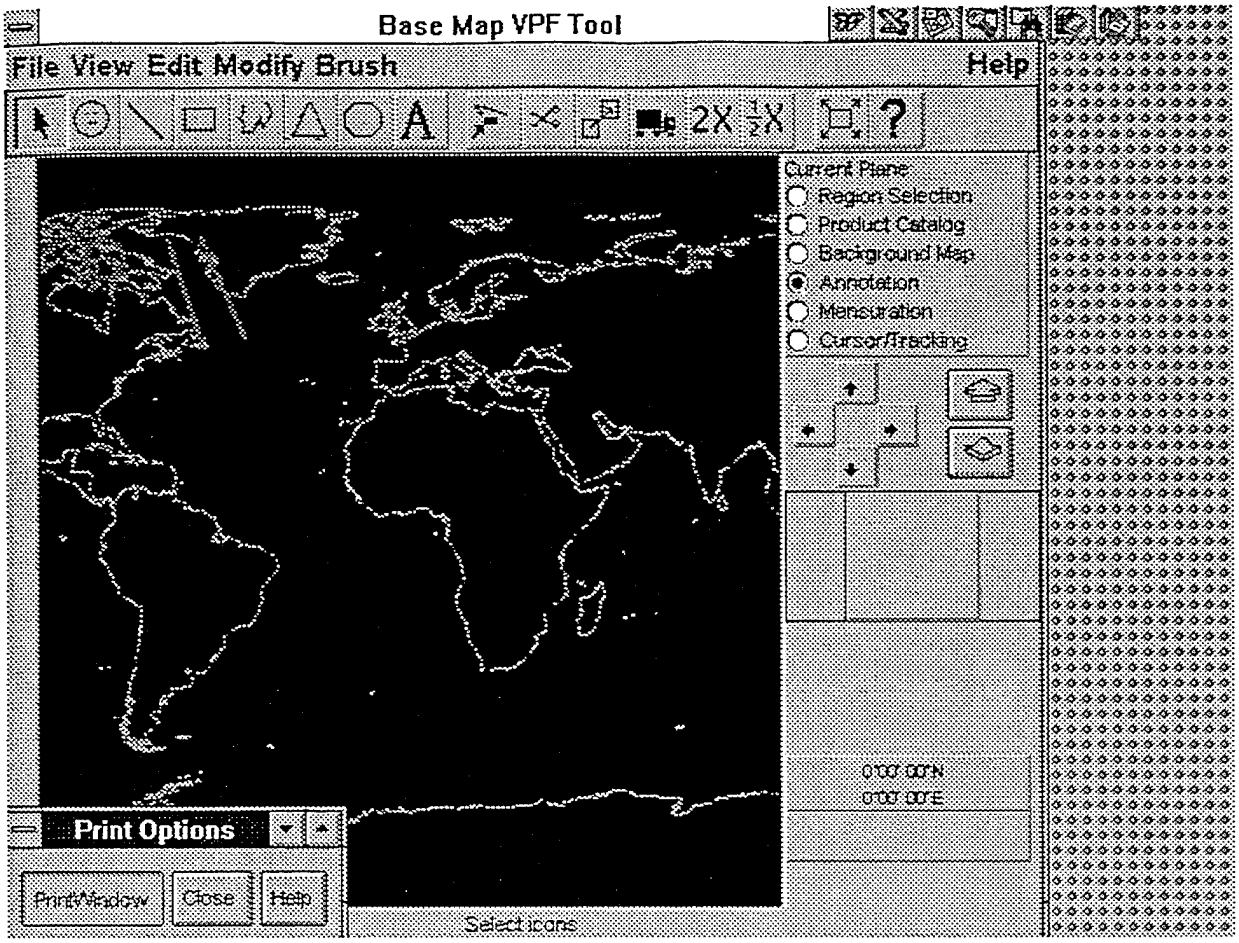


Figure 6. First example of print window option

2.2.7 DMA Query Tool

Different colors cannot be chosen for different products in a single query. Separate queries must be performed to give different colors for the products.

Geopolitical codes are not readily apparent.

In the *metadata* section, the scroll arrows are not repetitive.

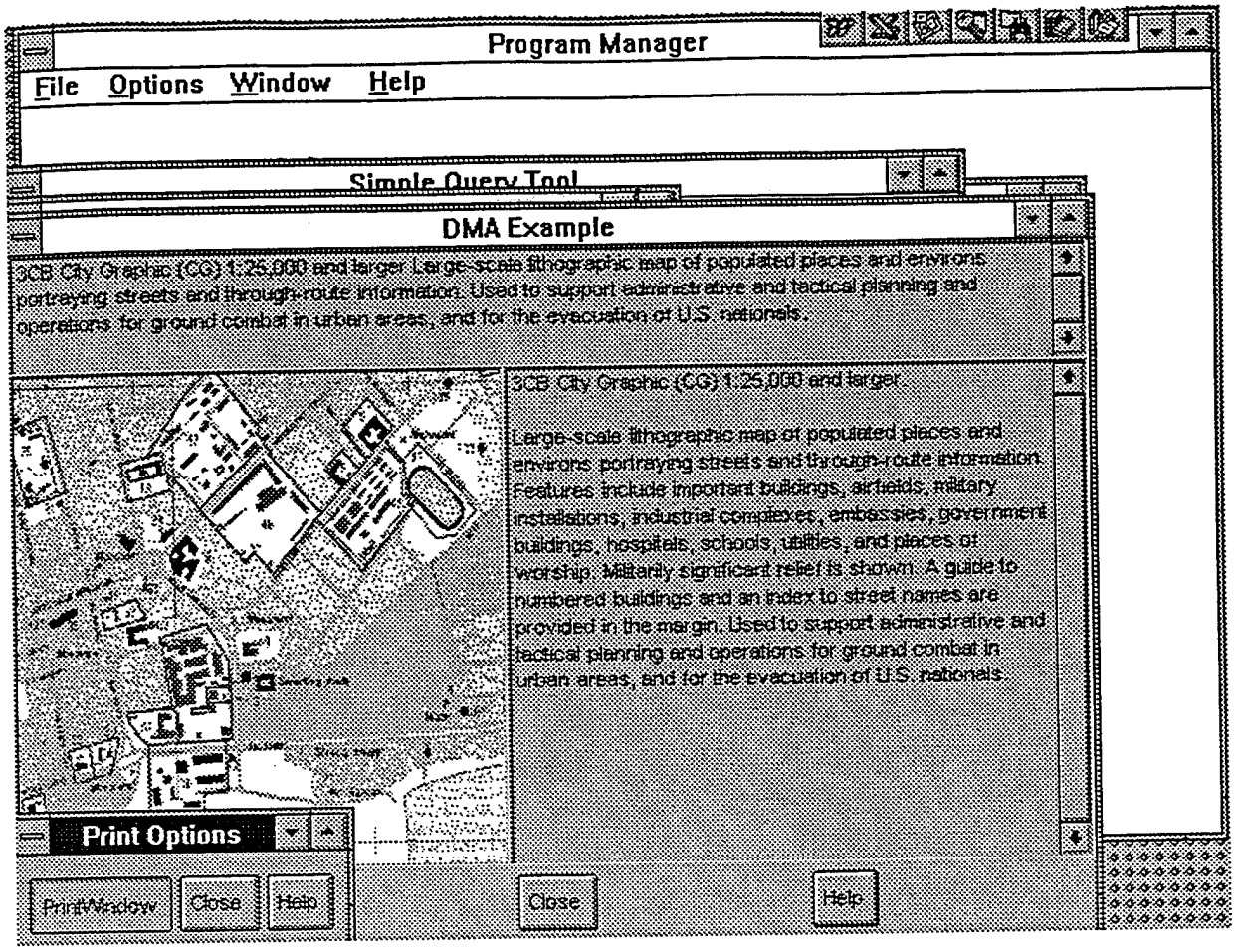


Figure 7. Second example of print window option

2.2.8 Defense Automated Message Exchange Systems Ordering Form

The Defense Automated Message Exchange Systems (DAMES) ordering form did not bring up the default customer information as expected. We were only successful in putting in the selected stock numbers to transfer to the order form. The printed form only showed the stock numbers (Figure 8); it would be helpful to have the entire DAMES screen printed for recordkeeping.

```
--.
      DTED130N094E      00001      52630000          00
      DTED129N089W      00001      52630001          00
      DTED129N090W      00001      52630002          00
      DTED130N088W      00001      52630003          00
      DTED130N090W      00001      52630004          00
      DTED130N089W      00001      52630005          00
  UIAZZ        0000 5261913 0008-UUUU                        NNNN
```

Figure 8. First example of DAMES order format

2.2.9 Computer Problems

Using a Gateway 2000 486DX33, 8 Mb RAM, Windows 3.11, *cancel/ignore* messages were received when the program was first run. The same message was also received on a P5-60 using Windows 3.11.

Using a Gateway 2000 P5-60, 32 Mb RAM, Windows 3.11, the virtual memory was initially 10,206KB; we changed it to 20,480KB. The recommended 30 Mb was not available.

Using the 486 available in CWO3 Terry Dunn's MC&G G-2 office at Camp Lejuene, the error message *Gview.exe - Unhandled exception detected. Application Terminated.* was received. The program reverted back to the Windows Program Manager screen.

2.2.10 Printer Problems

Print topic printed a blank page before the document Base Map VPF Tool.

When using a Hewlett Packard LaserJet 4, the background default overwrote the printed text (Figures 9 and 10). Figure 11 shows the same problem using Windows 95.

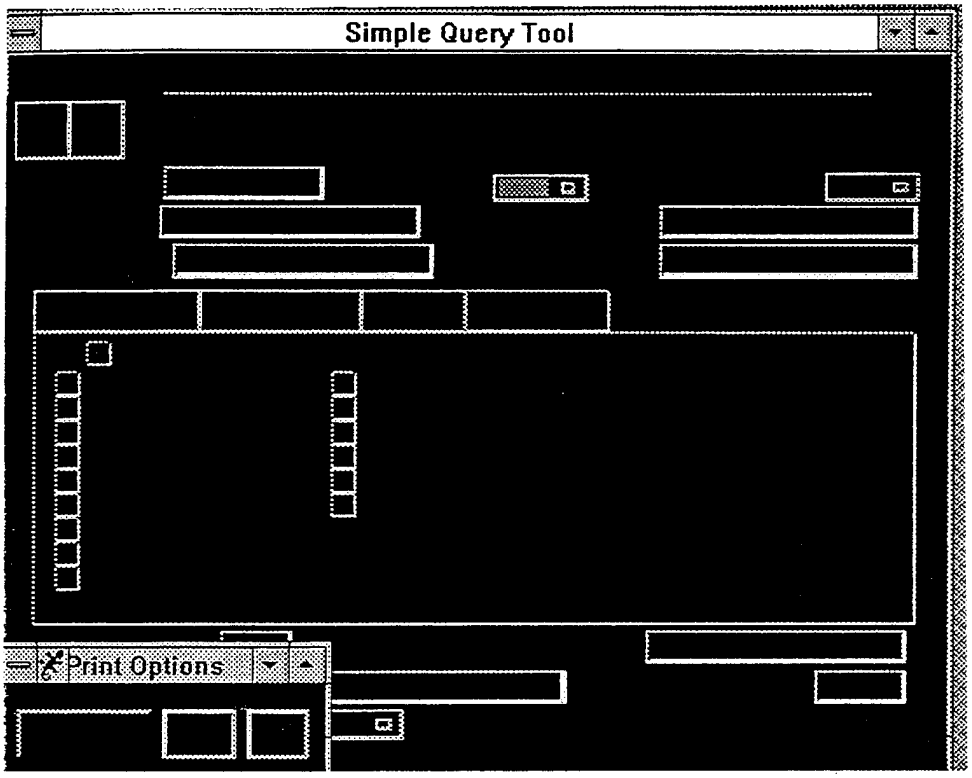


Figure 9. Second example of blackened text

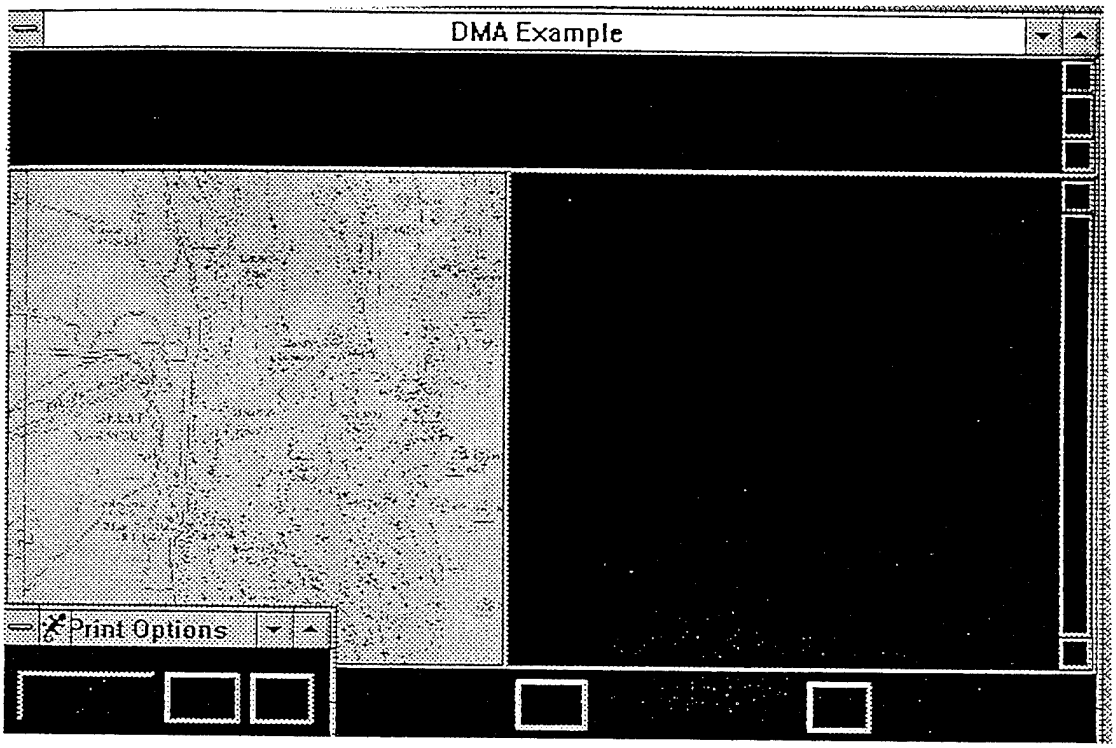


Figure 10. Third example of blackened text

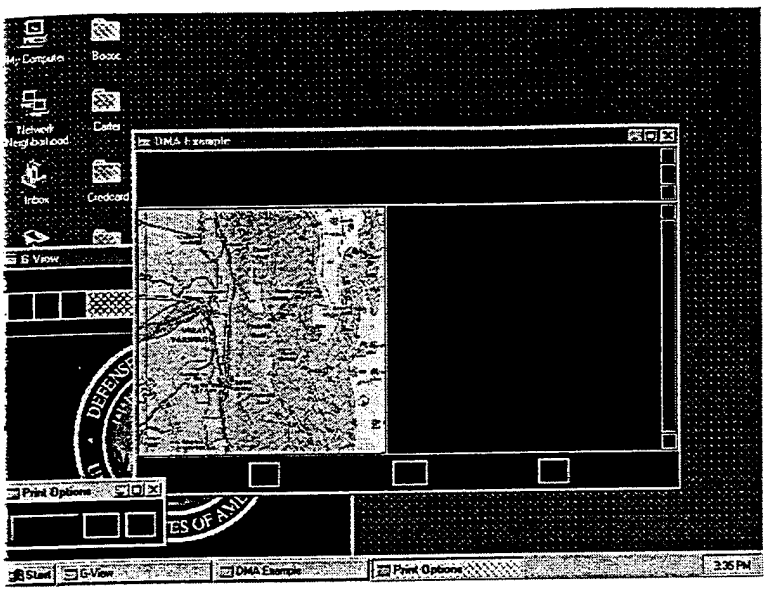


Figure 11. Fourth example of blackened text

3.0 Comments and Changes from Review of Prototype 0.0

The following table summarizes the comments and recommendations made in the DMAP review of Prototype 0.0, and the corresponding changes made in Prototype 1.0.

Table 1. Prototype 0.0 Changes Made in Prototype 1.0

DMAP Comments/Recommendations	Changes Made for Prototype 1.0
When installation is complete, the program should ask the user if Windows should be restarted or continued as is.	When installation is complete, the program asks the user if Windows should be restarted or continued as is.
Application terminated sometimes upon executing the G-View icon.	Application did not terminate at start-up.
The Print Options command caused an error and terminated the application.	The Print Options command work correctly.
Resizing the G-View Browser window does not resize the viewing area.	The viewing area becomes larger, allowing more text to be displayed, when the G-View window is resized.
Options common to all VPF Tool planes should be easily located on the menu bars.	The options are in the same location for each plane and are now easily accessed.
Replace the word "Done" with the more commonly used "Close" for Windows Applications.	The File/Close option is now available and is located in the uppermost left menu on each screen.
Not all "L:* M:* R:*" mouse button commands are usable by the common two-button mouse.	"L:* M:* R:*" mouse button commands are no longer given; instead, user-friendly menus are employed.
Edit options on the annotate plane do not show unless the screen is enlarged.	Annotation Edit options are clearly displayed on a top menu bar.
The screen text should be easier to read at higher resolutions.	Background colors, distinct menu buttons, and larger fonts improve screen readability.
Buttons and check boxes need to appear 3-dimensional and pushable.	Buttons and check boxes now appear 3-dimensional and pushable.
Glossary does not include the majority of DMA products or their scales.	Examples of DMA products include relevant information and map scales for most products.
Windows menu bars need to be used.	Windows menu bars are now used.

The following table summarizes the comments and recommendations made in the DMAP review of Prototype 0.0 that are still felt to be needed changes prior to final release.

Table 2. Prototype 0.0 Changes Not Made

DMAP Comments/Recommendations from Prototype 0.0
Minimize the Windows Program Manager when opening G-View.
Provide the Windows double click ability on G-View selections.
Provide the ability to close screen through the File/Close Windows option.
Improve the text readability at all resolutions, especially at 1024 x 768 resolution or greater.
Provide an escape mechanism.

4.0 Documentation Typographic Errors

Documentation	Location	Questionable Item
MCS Documentation dated 5/30/95 distributed with CDROM	Page 3, Known Product Constraints, 2nd sentence	*constraintss*
Base Map VPF	Section B, 1st line	*are used* repeated
Base Map VPF	Section C, 3rd &, 1st line	What is *Toggle Select Plane*?
Base Map VPF	Product Constraints, 1st sentence	*list of know constraints.* An "n" should be added to know.

5.0 Additional Prototype 0.0 Comments

The following comments were not received in time to include in the Prototype 0.0 evaulation and are included in this evaluation process.

Many DMA stock numbers shown by MCS are entirely bogus. Only an experienced user will know this.

The quality feedback card print function should give the customer a postage paid feedback card like the analog version.

White type on black background is hard on the eyes.

An attempt to order Digital Terrain Elevation Data (DTED) CDROM stock number TCDXXDTED120 (Germany) was made. This was impossible to do with SCC. The software bombed out and listed over 100 products, when in fact there are only 68 CDROMs of DTED for the whole world.

5.1 Graphics Display

Area fills (i.e., Digital Nautical Chart (DNC) coverage areas) obscure graphics underneath. Need to have a "transparent" type of fill in order to see the graphics beneath the text.

The software appeared to be highly nonintuitive. Unsure of how to execute actions; fields were unclear in their meaning and desired values. Steps to be taken were unclear.

Suggest that each product type/series/scale be a different color on the Base Map so that a decision could be made if whether ordering one scale/series would suffice for needs, or if multiple scales are needed.

5.2 Application Software

Was not able to get any queries to return with query tool. The *Edit VPF Features* button on VPF Plane area did nothing.

5.3 Other Problems

The *Properties* button on the *Layers* menu did not always work (using VPF Tool). Was not able to select ROI. Systems sometimes hung up after doing many random feature selections.

Was able to display the DD Form 173/2 and SF 344; however, both were identical on the screen. Not being familiar with either of the forms, their correctness is uncertain. When printing, the DD Form 173/2 printed, but only a blank screen was printed for the SF 344. An attempt was made to do the electronic milstrip, but the saved order could not find it on the machine. When saving an order using the *save* key, the message "error trying to save" was received at the bottom of the window.

5.4 System Response

The Base Map was so extremely slow to load that the computer had to be rebooted, and after a second failed attempt, no retry was made. We were unable to perform queries due to nonintuitiveness and inaccessability to CDROM-based documentation.

6.0 Recommendations

Based on the preceding comments, DMAP makes the following recommendations:

1. MCS should remain in prototype state with another prototype issued to rectify noted problems.

2. Address proprietary software issue to make available to the public the necessary software to run MCS.

3. Provide MCS for a UNIX environment.

4. Provide the capability to backup a screen or multiple screens without starting over.

5. Provide an escape mechanism to back out of program quickly and gracefully.

6. Provide the user with pop-up choices when asking to provide input.

7. Change unreadable drop menus to Windows-standard shaded gray.

8. Move screen output from bottom left so Windows 95 will not overwrite.

9. Provide MCS in a series of tables containing ASCII characters with fields delimited by commas or tabs, with the first line containing field names to import into other VPF software.

10. Provide all scroll bars with repetitive movement.

11. Make the Base Map center pivot around the user-selected location rather than the Atlantic Ocean.

12. Change Print Window option to print just the top window.

13. Provide computerized postage-paid feedback card like the analog version.

14. Provide transparent type of text fill to see graphics beneath.

15. Provide a short tutorial.

16. Provide the ability to close window through the Windows standard File/Close. (For Windows 95, provide the ability to close through the close button in upper right corner.)

17. Provide Windows double-click ability to activate selections.

7.0 Conclusions

The DMAP technical review team found Prototype 1.0 to be an improvement, but still not acceptable due to noted problems. The concept is still an excellent idea for electronic ordering of charts and maps; however, the implementation is poor. The mechanics of the software still leave a lot to be desired for a Windows program.

There is still some concern about the software's speed, especially on lower-end machines. The jump from 16-bit to 32-bit machines made a huge improvement, as well as the jump from 486 to Pentium.

In summary, a comment made by LCDR Zdenka Willis during the evaluation of Prototype 0.0 is worthy of mention: "Within the Base Map function, you should be able to define a point or area of interest by geographics or drawing a rectangle. You should then see country boundaries, appropriate place names, and lat/long. Then you should be able to click again on your refined area of interest, enter any limiting parameters, and get a list of all products available for that area of interest."

DMAP does not recommend this prototype for release as a product!

8.0 Acknowledgments

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